

WHAT IS CLAIMED IS:

- 1 1. A method for identifying an agent for treating a diabetic or pre-diabetic
2 individual, the method comprising the steps of:
 - 3 (i) contacting a candidate agent with a kidney or pancreatic cell that
4 expresses a nucleic acid encoding a polypeptide having glucose phosphorylating activity that
5 comprises at least 20 contiguous amino acids of SEQ ID NO:2;
 - 6 (ii) determining the activity of the polypeptide; and
 - 7 (ii) selecting an agent that inhibits the activity of the polypeptide, thereby
8 identifying an agent for treating a diabetic or pre-diabetic individual.
- 1 2. The method of claim 1, wherein the polypeptide comprises SEQ ID
2 NO:2.
- 1 3. The method of claim 1, wherein the polypeptide is overexpressed
2 relative to normal.
- 1 4. The method of claim 1, wherein the cell is a pancreatic cell.
- 1 5. The method of claim 4, wherein the pancreatic cell is from a diabetic
2 animal.
- 1 6. The method of claim 1, wherein the step of determining the activity of
2 activity of the polypeptide comprises determining the ability of the polypeptide to
3 phosphorylate a hexose.
- 1 7. The method of claim 1, wherein the step of determining the activity of
2 the polypeptide comprises determining the amount of protein present using an immunoassay.
- 1 8. The method of claim 1, wherein the agent is an siRNA.
- 1 9. The method of claim 1, wherein the agent is an antisense RNA.
- 1 10. A method for identifying an agent for treating a diabetic or pre-diabetic
2 individual, the method comprising the steps of:
 - 3 (i) contacting a candidate agent with a kidney or pancreatic cell that
4 expresses a nucleic acid encoding a polypeptide having glucose phosphorylating activity that
5 comprises at least 20 contiguous amino acids of SEQ ID NO:2;

6 (ii) determining the level of an RNA that encodes the polypeptide; and
7 (ii) selecting an agent that inhibits the activity of the polypeptide, thereby
8 identifying an agent for treating a diabetic or pre-diabetic individual.

1 11. The method of claim 10, wherein the polypeptide comprises SEQ ID
2 NO:2.

1 12. The method of claim 10, wherein the cell is a pancreatic cell.

1 13. The method of claim 10 wherein the pancreatic cell is from a diabetic
2 animal.

1 14. The method of claim 10, wherein the step of determining the level of
2 an RNA that encodes the polypeptide comprises an amplification reaction.

1 15. The method of claim 10, wherein the cell is a pancreatic islet cell.

1 16. The method of claim 10, wherein the agent is an siRNA.

1 17. The method of claim 10, wherein the agent is an antisense RNA.

1 18. The method of claim 1 or claim 10, further comprising:
2 administering the agent to a diabetic or pre-diabetic animal;
3 determining the response of the animal to glucose; and
4 selecting a candidate agent that improves the response to glucose.

1 19. The method of claim 18, wherein the step of determining the response
2 of the animal to glucose comprises determining the level of glucose-induced insulin
3 secretion.

1 20. The method of claim 1 or claim 10, further comprising:
2 administering the agent to an animal that is a diabetic or pre-diabetic model;
3 determining the level of the polypeptide or the nucleic acid encoding the
4 polypeptide in a pancreatic sample from the animal; and
5 selecting the candidate agent that decreases the level of the polypeptide or the
6 nucleic acid.

1 21. A method for identifying an agent for treating a diabetic or pre-diabetic
2 individual, the method comprising the steps of:

- 3 (i) contacting a candidate agent with a polypeptide having glucose
4 phosphorylating activity that comprises at least 20 contiguous amino acids of SEQ ID NO:2;
5 (ii) determining binding of the agent to the polypeptide;
6 (iii) selecting an agent that binds to the polypeptide;
7 (iv) administering the agent to a diabetic or pre-diabetic animal;
8 (v) determining the response of the animal to glucose; and
9 (vi) selecting an agent that improves the response to glucose.

1 22. The method of claim 21, wherein the step of determining binding of
2 the agent to the polypeptide comprises determining the activity of the polypeptide.

1 23. The method of claim 21, wherein the step of determining the response
2 of the animal to glucose comprises determining the level of glucose-induced insulin
3 secretion.

1 24. A method of regulating glucose sensitivity in a diabetic animal or a
2 pre-diabetic animal, the method comprising administering to the animal a therapeutically
3 effective amount of an agent identified by the method of claim 1, claim 10, or claim 24.

1 25. The method of claim 24, wherein the agent is administered to
2 pancreatic tissue.

1 26. The method of claim 24, wherein the animal is a human.

1 27. A method of introducing an expression cassette into a pancreatic cell,
2 the method comprising,
3 introducing into the cell an expression vector comprising a nucleic acid that,
4 when expressed, inhibits the expression of a nucleic acid encoding a polypeptide having
5 glucose phosphorylating activity that comprises at least 20 contiguous amino acids of SEQ
6 ID NO:2.

1 28. The method of claim 27, wherein the polypeptide comprises SEQ ID
2 NO:2.

1 29. The method of claim 27, further comprising introducing the cell into a
2 diabetic animal.

1 30. The method of claim 29, wherein the cell is from the human.

1 31. A method of diagnosing a prediabetic or diabetic patient; the method
2 comprising:

3 detecting an increase, relative to normal, in the level of a polypeptide of SEQ
4 ID NO:2 in a sample from the patient, thereby diagnosing the diabetic or prediabetic patient.

1 32. An isolated nucleic acid encoding a polypeptide comprising an amino
2 acid sequence as set forth in SEQ ID NO:4.

1 33. An isolated nucleic acid comprising the nucleic acid sequence of SEQ
2 ID NO:3.